# FORM 5 . BAB 1 NO. BASES

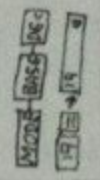
| SPM | analysis (P1 Q#) |
|---|---|
| 2015 | 4,5 |
| 2016 | 5,6 |
| 2017 | 4,5 |
| 2018 | 5,6 |
| 2019 | 5,6 |
| 2020 | 5,6 |

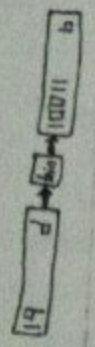
✓ Soalan minta tukar dari base 10 kpd base 2, 5, 8 & sebaliknya.

✓ ada 3 bhgn ✓ pertukaran
✓ penambahan
✓ penolakan.

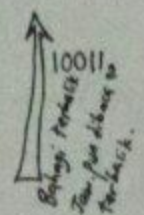
## Pertukaran

Base 10 (CAW) 19 — guna 3 no. skrg automatically base 10.

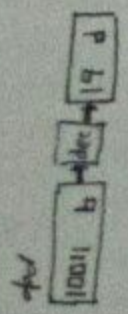





| 2 \| 19 | baki |
|---|---|
| 2 \| 9 | … 1 |
| 2 \| 4 | … 1 |
| 2 \| 2 | … 0 |
| 2 \| 1 | … 0 |
| 0 | … 1 |




Base 2
(BIN - Binary)
$10011_2$




1 0 0 1 1
$2^4$ $2^3$ $2^2$ $2^1$ $2^0$

$= 1\times2^4 + 0\times2^3 + 0\times2^2 + 1\times2^1 + 1\times2^0$
$= 16 + 2 + 1$
$= 19$

| 5 \| 19 | baki |
|---|---|
| 5 \| 3 | … 4 |
| 0 | … 3 |

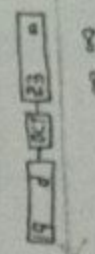
TIPS dpt baki daripada calculator:
$19 \div 5 = 1.8$
ab/c
3,4,5 — baki adalah kedua dari kanan.

Base5 $\Rightarrow 34_5$
(TAKDE DLM CALCULATOR)

3 4

$5^1$ $5^0$

$= 3\times5^1 + 4\times5^0$
$= 15 + 4$
$= 19$




| 8 \| 19 | baki |
|---|---|
| 8 \| 2 | … 3 |
| 0 | … 2 |

Base 8 $\Rightarrow 23_8$
(Oct ~ Octagon ada 8 penjuru)

2 3

$8^1$ $8^0$

$= 2\times8^1 + 3\times8^0$
$= 16 + 3$
$= 19$

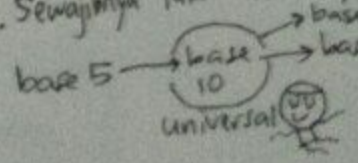
Kalau cari baki guna calculator:
$2 \div 8 = 0.25$
ab/c
1, 4
baki bahagi 1... sbnyk 2.
2/8 — tak perlu guna calculator
1/4

Jadi...
1 : 4
$\times 2$ $\times 2$
2 : 8 — bilangan kedua sama, baki 1

Cth lain
$28 \div 8$
calculator $\Rightarrow 3.5$ — ab/c — $3,1,2$
manual
3,4,8
$3\frac{4}{8} \Rightarrow 3\frac{1}{2}$
4 baki




★ Soalan akan suruh tukar dpd (CAW) base 5 kpd (CAW) base 2 (atau base 8) ... Mustahil dpt tukar base 5 → base 2. Sewajibnya tukar dahulu ke base 10

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# Form 5 Bab 2 GRAPH

Ada 3 types of question based on paper 1 & 2 in spm.

| spm analysis | P1 | P2 |
|---|---|---|
| 2005 | 28 | 3, 12 |
| 2006 | 28 | 9, 13 |
| 2007 | 28 | 1, 12 |
| 2008 | 28 | 12 |
| 2009 | 30 | 1, 12 |
| 2010 | 30 | 12 |

## Paper 1 Identify Graph & Equation

① Lurus

$y = 3x - 2$ $y = -2x + 4$

grad +ve, y-intercept; grad (-ve), y-intercept

② Quadratic

$y = 1x^2 - 2x - 3$ or $y = -x^2 + 2x + 3$

+ve, y-intercept; -ve sad, y-intercept

smile

← pastikan pakai x guna calculator

calculator: a? = -1, b? = 2, c? = 3

mode eqn Deg ?

kemungkinan $ax^2 + bx + c$

a? = 1, b? = -2, c? = -3

$x_1 = 3$, $x_2 = -1$

$x_1 = 3$, $x_2 = -1$

Notice no. tersendiri dlm eq (yg tide kaitan dgn x), adalah y-intercept!

Cubic

③ $y = x^3 - 1$

y-intercept

$y = ax^3 + bx^2 + cx^1 + d$

$y = 1x^3 + 0x^2 + 0x - 1$

mode eqn → Deg 3

a = 1, b = 0, c = 0, d = -1

$x_1 = 1$, $x_2 = -0.5$, $x_3 = -0.5$ (R-I, R-I)

tow ini abaikan

④ Reciprocal

$y = \frac{5}{x}$ $y = \frac{-5}{x}$

+ve; tide constant, ∴ tide y-intercept

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## Paper 2 (A) Region & Inequality

symbol > < ... lukis garis putus²

symbol ≥ ≤ ... lukis garis bersambung

Basicly ada 2 jenis equation.

- yg ada huruf y → labelkan y & ><
  - y ... < } lorek Bawah
  - y ... ≤ } lorek Bawah
  - y ... > } lorek ATAS
  - y ... ≥ } lorek ATAS
- yg tide huruf y. ada x shj → labelkan x & ><
  - x ... < } lorek kiri
  - x ... ≤ } lorek kiri
  - x ... > } lorek kanan
  - x ... ≥ } lorek kanan

(tk) (y) + x ≥ 3 ATAS

(y) ≤ 1 + x Bawah

x + 3 ≤ (y) atas

(x) + 1 < 0

(x) ≥ 5

## Paper 2 (B) Plot & Solve

► $y = x^2 + 3x + 2$ → guna calculator

| x | -2 | -1 | 0 | 1 | 2 |
|---|---|---|---|---|---|
| y | 0 | | | | |

x^2 + 3x + 2 ⇒ alang tekan AC

-2 = 0

► scale of 2cm to 1 unit on the x-axis
(ertinya, setiap selang 2cm, selangkan 1 unit)

► scale of 2cm to 5 units on the y-axis
(ertinya, setiap selang 2cm, selangkan 5 unit)

► for $-2 \leq x \leq 2$
(ertinya mulakan paksi-x serendah -2, smp 2)

7 2cm

2cm

Berpadalah melukis ☺

lihat dem

SOLVE (SATISFY the equation)

► Draw a straight line ... to satisfy the equation

biasa ada 2 eq ... yg asal & yg baru.

utk solve, kene +/- @ substitution utk dpt persamaan garis lurus

(tk) Given $y = x^3 - 8x + 12$ &

$0 = x^3 - 8x - 6$ ×2

$y = -8x + 8x + 12$ tolak sama

$y = 18$ ✱ Draw

(cth) Given $y = x^3 - 3x + 12$

$0 = 8x - x^3$ ×2

$y = -3x + 8x + 12$

$y = 5x + 12$ ✱ draw

memadai 2 titik utk jana satu garis lurus

| x | 0 | 1 |
|---|---|---|
| y | 12 | 17 |

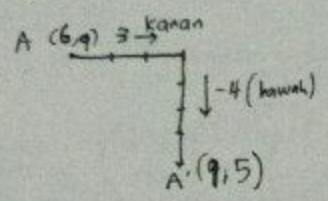
# Form 5 : Bab 3 Transformation

titik A = yang asal (object ~ original)
titik A' = selepas transformation (imej)

| SPM analysis | | |
|---|---|---|
| | P1 | P2 |
| 2005 | 9,10 | 13 |
| 2006 | 9,10 | 12 |
| 2007 | - | 15 |
| 2008 | 9,10 | 13 |
| 2009 | 10,11 | 13 |
| 2010 | 10,11 | 13 |

## ① TRANSLATION

mewakili pergerakan $\begin{pmatrix} \text{kiri/kanan} \\ \text{atas/bwh} \end{pmatrix}$ cth $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$ pada titik (6,9)




## ② Reflection

WAJIB ADA
✓ coordinate object & imej
✓ paksi pantulan

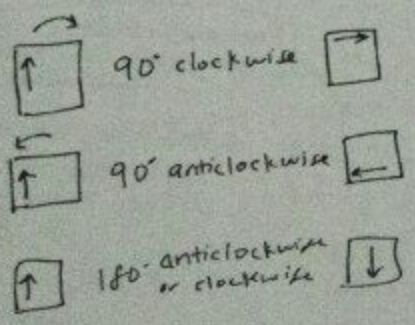
→ lukiskan paksi pantulan pada soalan (petak²)
→ tekap kertas minyak pada soalan, lukis object & paksi pantulan.
→ TERBALIKKAN kertas minyak & samakan paksi-paksi pantulan.

~ lihat demo ~

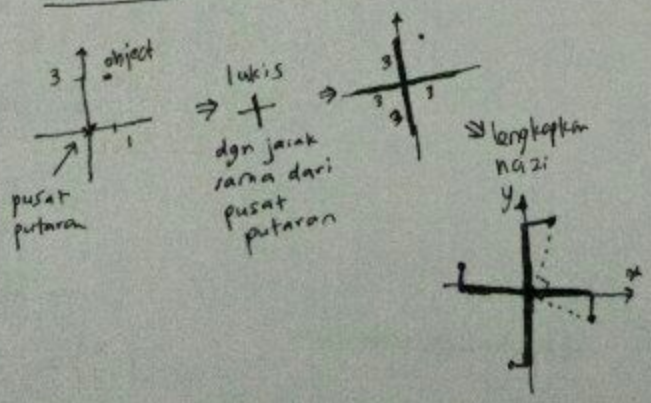
## ③ Rotation

WAJIB ada
✓ centre of rotation
✓ coordinate object, imej
✓ Angle of rotation

→ lukiskan pusat putaran pada soalan (petak²)
→ tekap kertas minyak, & lukis object pada kertas minyak.
→ cocok pusat putaran & pusingkan kertas minyak bagaikan jarum jam.




Alternative (NAZI) 卐



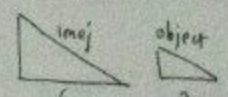

## ④ Enlargement

WAJIB ADA
✓ scale factor
✓ centre enlargement.

formula given in SPM

Scale factor (k) = $\frac{\text{panjang sisi baru}}{\text{panjang sisi lama}}$

Cth



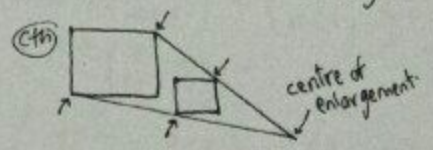

$k = \frac{6}{2}$

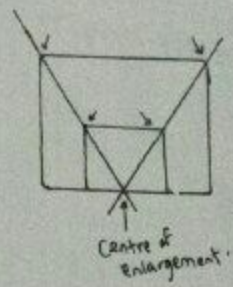
$k = 3$

Q Finding Centre of Enlargement ?

A Sambung sekurang-kurangnya 2 buah sama sampai garisan tersebut bersilang.

Cth




## ⑤ AREA of OBJECT & IMEJ

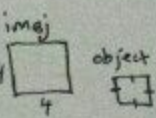
diberi dlm SPM

Area Imej = $k^2$ x Area Object.

Soalan pusing³ sarah cari salah satu.

TIP: Area shaded = Area object terbesar − Area bentuk terkecil.

Cth




what is the sides of a square object given enlargement scale used was 2.

Area imej = $k^2$ x area object
$4 \times 4 = 2^2 \times$ area obj.
$16 = 4 \times$ area obj.
$4 = $ area obj
then sides $\square^2$

## ⑥ SPM

COMBINED TRANSFORMATION.

✓ Akan ada 2 Transformation (antara 4 yg dibincang tadi).
✓ Jenis transformation diwakili dgn huruf besar.
cth: M = rotation 90° clockwise at centre (0,1).
N = translation $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$
✓ Transformation dilakukan/dibaca secara TERBALIK!
cth: MN ⇒ ertinya N dahulu, diikuti M.
NM ⇒ ertinya M dahulu, diikuti N.

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BAB 4

# FORM 5 MATRICES

| SPM Analysis | Paper 1 | Paper 2 |
|---|---|---|
| 2005 | 39, 40 | 11 |
| 2006 | 39, 40 | 11 |
| 2007 | 39, 40 | 9 |
| 2008 | 39, 40 | 8 |
| 2009 | 39, 40 | 7 |
| 2010 | 39, 40 | 11 |

## EQUAL MATRIX

$\begin{pmatrix} a & b \\ c & d \end{pmatrix} = \begin{pmatrix} e & f \\ g & h \end{pmatrix}$ ← ertinya, komponen kedudukan sama

$a = e$
$b = f$
$c = g$
$d = h$

Cth:

$\begin{pmatrix} -1 & -2 \\ 3 & 4 \end{pmatrix}\begin{pmatrix} 2 \\ 1 \end{pmatrix}$

$= \begin{pmatrix} -1(2) - 2(1) \\ 3(2) + 4(1) \end{pmatrix}$

$= \begin{pmatrix} -4 \\ 10 \end{pmatrix}$ ✱

Cth:

$(1 \quad 2)\begin{pmatrix} 0 \\ 2 \end{pmatrix}\begin{pmatrix} 1 \\ 3 \end{pmatrix}$

$= (1\times0 + 2\times2 \quad 1\times1 + 2\times3)$

$= (4 \quad 7)$ ✱

Cth:

$\begin{pmatrix} 1 \\ 3 \end{pmatrix}(0 \quad 1)$

$= \begin{pmatrix} 1\times0 & 1\times1 \\ 3\times0 & 3\times1 \end{pmatrix}$

$= \begin{pmatrix} 0 & 1 \\ 0 & 3 \end{pmatrix}$ ✱

Cth:

$(1 \quad 2)\begin{pmatrix} 0 \\ 2 \end{pmatrix}$

$= (1\times0 + 2\times2)$

$= (4)$ ✱

Cth:

$\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 0 & 1 \end{pmatrix}\begin{pmatrix} 0 & 1 \\ 2 & 3 \end{pmatrix}$

$= \begin{pmatrix} 1\times0 + 2\times2 & 1\times1 + 2\times3 \\ 3\times0 + 4\times2 & 3\times1 + 4\times3 \\ 0\times0 + 1\times2 & 0\times1 + 1\times3 \end{pmatrix}$

$= \begin{pmatrix} 4 & 7 \\ 8 & 15 \\ 2 & 3 \end{pmatrix}$ ✱

## Add / Substrack, Skalar multiplication

$3\begin{pmatrix} 1 & 4 \\ 2 & -1 \end{pmatrix} = \begin{pmatrix} 3 & 12 \\ 6 & -3 \end{pmatrix}$

$\frac{1}{2}\begin{pmatrix} 6 & -10 \\ 8 & 3 \end{pmatrix} = \begin{pmatrix} 3 & -5 \\ 4 & 3/2 \end{pmatrix}$

$\begin{pmatrix} 4 & 3 \\ -2 & 1 \end{pmatrix} + \begin{pmatrix} 2 & 0 \\ 1 & -4 \end{pmatrix} = \begin{pmatrix} 4+2 & 3+0 \\ -2+1 & 1+(-4) \end{pmatrix}$

$= \begin{pmatrix} 6 & 3 \\ -1 & -3 \end{pmatrix}$

$\begin{pmatrix} 8 & -1 \\ 2 & 0 \end{pmatrix} - \begin{pmatrix} 7 & 4 \\ 5 & -1 \end{pmatrix} = \begin{pmatrix} 8-7 & -1-4 \\ 2-5 & 0-(-1) \end{pmatrix}$

$= \begin{pmatrix} 1 & -5 \\ -3 & 1 \end{pmatrix}$

## MATRIX darab MATRIX

Pulu in algebra $(3 + x)(2 - x) = 6 - 3x + 2x - x^2$

Berbeza dgn matrix $(3 \quad x)\begin{pmatrix} 2 \\ x \end{pmatrix} = (6 + x^2)$

Lagi senang! pertama darab pertama, kedua darab kedua, ketiga darab ketiga

$(1 \quad 2 \quad -3)\begin{pmatrix} 4 \\ 5 \\ 6 \end{pmatrix} = (1\times4 + 2\times5 + (-3)\times6) = (-4)$

## CARA MENDARAB MATRIX (Cara Cikgu Hassan ☺)

Pada matrix
① Pertama, bulatkan baris Atas / Bawah / Tengah
② Pada matrix kedua, bulatkan lajur Kiri / tengah / kanan.
① labelkan: Atas Bawah ... Kiri ... kanan.

Jalan kira:
- Atas x Kiri
- Atas x Kanan
- Bwh x Ki
- Bwh x Ka

Hasil kembangan turut diletakkan di tempat ATAS 2 di K(Ki).

Cth:

$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}\begin{pmatrix} 0 & 1 \\ 2 & 3 \end{pmatrix}$

Atas x Kiri: $\begin{pmatrix} 1 & 2 \\ \cdot & \cdot \end{pmatrix}\begin{pmatrix} 0 & \cdot \\ 2 & \cdot \end{pmatrix} = \begin{pmatrix} 1\times0+2\times2 & \cdot \\ \cdot & \cdot \end{pmatrix}$

Atas x Kanan: $\begin{pmatrix} 1 & 2 \\ \cdot & \cdot \end{pmatrix}\begin{pmatrix} \cdot & 1 \\ \cdot & 3 \end{pmatrix} = \begin{pmatrix} \cdot & 1\times1+2\times3 \\ \cdot & \cdot \end{pmatrix}$

Bwh x Ki: $\begin{pmatrix} \cdot & \cdot \\ 3 & 4 \end{pmatrix}\begin{pmatrix} 0 & \cdot \\ 2 & \cdot \end{pmatrix} = \begin{pmatrix} \cdot & \cdot \\ 3\times0+4\times2 & \cdot \end{pmatrix}$

Bwh x Ka: $\begin{pmatrix} \cdot & \cdot \\ 3 & 4 \end{pmatrix}\begin{pmatrix} \cdot & 1 \\ \cdot & 3 \end{pmatrix} = \begin{pmatrix} \cdot & \cdot \\ \cdot & 3\times1+4\times3 \end{pmatrix}$

Habis kira... Jadi lah! mpunyai Atas Bwh Ki Kanan, sama spt yg dilabelkan

akhir sekali ... $= \begin{pmatrix} 4 & 7 \\ 8 & 15 \end{pmatrix}$

Jika $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}\begin{pmatrix} \cdot & \cdot \\ \cdot & \cdot \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, maka $\begin{pmatrix} \cdot & \cdot \\ \cdot & \cdot \end{pmatrix} = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}^{-1}$

(pelaburan)

dikenali sebagai matrix inverse (songsangan)

Juga blh ditulis sbg $\begin{pmatrix} \cdot & \cdot \\ \cdot & \cdot \end{pmatrix}\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

ok... katakan $A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$, maka $A^{-1} = \frac{1}{ad - bc}\begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$ diberi dlm SPM formula

Contohnya $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}^{-1} = \frac{1}{1(4) - 2(3)}\begin{pmatrix} 4 & -2 \\ -3 & 1 \end{pmatrix}$

$= \frac{1}{-2}\begin{pmatrix} 4 & -2 \\ -3 & 1 \end{pmatrix}$

... cuba semak $\frac{1}{-2}\begin{pmatrix} 4 & -2 \\ -3 & 1 \end{pmatrix}\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

$= \frac{1}{-2}\begin{pmatrix} 4(1) - 2(3) & 4(2) - 2(4) \\ -3(1) + 1(3) & -3(2) + 1(4) \end{pmatrix}$

$= \frac{1}{-2}\begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix}$

$= \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ ✱ kan dibuktikan ☺

rangnya tak usik pecahan supaya kemas jalan kira ☺

## Cara lain menyelesaikan simultan eq:

$1x + 2y = 5$
$3x + 4y = 6$

$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 5 \\ 6 \end{pmatrix}$

$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}^{-1}\begin{pmatrix} 5 \\ 6 \end{pmatrix}$

Guna method cikgu Atas Bwh / Ki : kanan.

$= \frac{1}{-2}\begin{pmatrix} 4 & -2 \\ -3 & 1 \end{pmatrix}\begin{pmatrix} 5 \\ 6 \end{pmatrix}$

Perhatikan cikgu tak usik pecahan kedah di luar matrix tu ☺

$= \frac{1}{-2}\begin{pmatrix} 4(5) - 2(6) \\ -3(5) + 1(6) \end{pmatrix}$

$= \frac{1}{-2}\begin{pmatrix} 8 \\ -9 \end{pmatrix}$

Semak guna calculator

$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -4 \\ 9/2 \end{pmatrix} \rightarrow \begin{matrix} x = -4 \\ y = 9/2 \end{matrix}$

# FORM 5 : Bab 5 Variations

Ada 3 jenis soalan ← soalan berayat, persamaan, berjadual

| SPM analysis | P1 |
|---|---|
| 2005 | 36, 37, 38 |
| 2006 | 36, 37, 38 |
| 2007 | 36, 37, 38 |
| 2008 | 36, 37, 38 |
| 2009 | 37, 38 |
| 2010 | 37, 38 |

## (A) Soalan Berayat.

(4th) If M varies directly as the square of N & M = 4 when N = 9. Form an equation.

'Varies' adalah '$\propto$', yang ditukarkan kpd '=k' (k selalu di numerator)

'directly...' huruf susulan ditulis di Atas (Numerator)

'indirectly...' huruf susulan ditulis di Bawah (Denominator)

as the square of $x \Rightarrow x^2$
as the square root of $x \Rightarrow \sqrt{x}$
as the cube of $x \Rightarrow x^3$
as the cube root of $x \Rightarrow \sqrt[3]{x}$

$M \propto N^2$ (Not yet equation sbb ada ($\propto$) lagi. Tukarkan.)

$M = kN^2$

(use value M=4, N=9)

$4 = k(9)^2$

$4 = k(81)$

$\frac{4}{81} = k$

(Misi mencari apakah nilai k.)

$\therefore M = \frac{4}{81}N^2$ * This is the full equation!

(Cth) H varies directly as the cube of $x$ & inversely as the square root of $y$.

$H \propto \frac{x^3}{\sqrt{y}} \Rightarrow H = \frac{kx^3}{\sqrt{y}}$

(direct atas, inverse bawah)

## (B) Persamaan.

(5m) It is given that $H \propto \frac{m}{\sqrt{n}}$. $H = 9$ when $m = 3$ & $n = 4$. Calculate the value of $m$ when $H = 18$ & $n = 9$.

$H \propto \frac{m}{\sqrt{n}}$

$H = \frac{km}{\sqrt{n}}$

(Kene tukar $\propto$ kpd $= k$ baru blh start kira.)

(ganti nilai H=9, m=3, n=4)

$9 = \frac{k(3)}{\sqrt{4}}$

$\frac{9}{3} = \frac{k}{2}$

$k = 6$

$H = \frac{6m}{\sqrt{n}}$

$18 = \frac{6m}{\sqrt{9}}$

$\frac{18}{6} = \frac{m}{3}$

$m = 9$ * (:)

(setelah peroleh nilai k, baru boleh jawab persoalan berikutnya iaitu H=18, n=9)

## (C) Berjadual

(4m) The table shows the values of F & y. Given that F varies inversely as $y^2$, calculate the value of e.

| | | |
|---|---|---|
| F | 2 | e |
| y | 4 | 8 |

(nilai lengkap)

$F \propto \frac{1}{y^2}$

(Misi mencari nilai k)

$F = \frac{k}{y^2}$

ganti nilai yg lengkap F = 2, y = 4

$2 = \frac{k}{4^2}$

$32 = k$

(misi seterusnya mencari e)

$F = \frac{32}{y^2}$

ganti nilai F = e, y = 8

$e = \frac{32}{8^2}$

$e = \frac{1}{2}$ * (:) (Selamat mencuba!)

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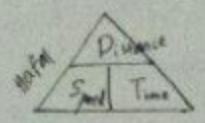
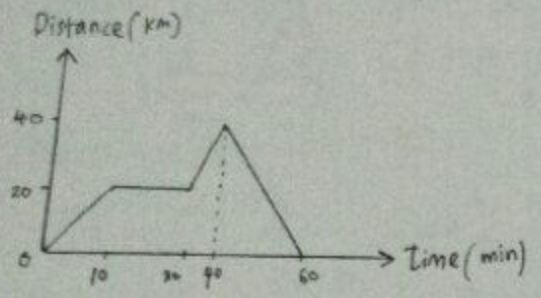
# Form 5 Bab 6 Gradient & Area under Graph

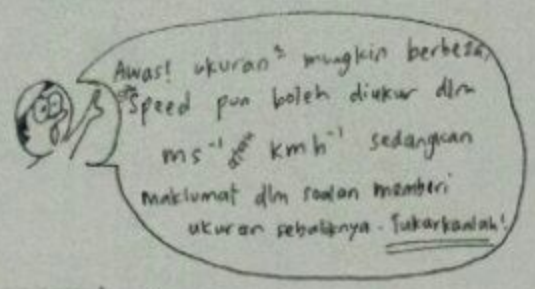
SPM analysis

| | P2 |
|---|---|
| 2005 | 10 |
| 2006 | ... |
| 2007 | 10 |
| 2008 | 9 |
| 2009 | 11 |
| 2010 | 10 |

2 jenis graf shj → Distance, Time
→ Speed, Time

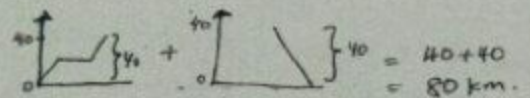


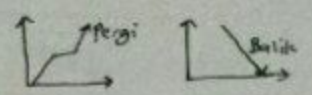





Awas! ukuran² mungkin berbeza. Speed pun boleh diukur dlm ms⁻¹ / kmh⁻¹ sedangkan maklumat dlm soalan memberi ukuran sebaliknya. Tukarkanlah!

[1] Gradient at any interval ⇒ speed = $\frac{\text{Distance travelled}}{\text{time taken}}$

[2] No motion (tak gerak) ⇒ dalam tempoh 10 – 30 min.

[3] Distance travelled ⇒ 


[4] Perjalanan ⇒ Pergi & Balik 


[5] Sodlan Selalu Suruh kira

(i) Speed dari tempoh bila ke bila. [speed $km\,h^{-1}$] → km/h ← hanyalah dlm sebutan jam.

(CM) find speed in first 10 min.

$$\text{Speed} = \frac{\text{Distance travelled}}{\text{time taken}} = \frac{20-0\ km}{(10-0)\ min}$$

$$= \frac{20}{10 \div 60}$$ ← utk tukar min → jam

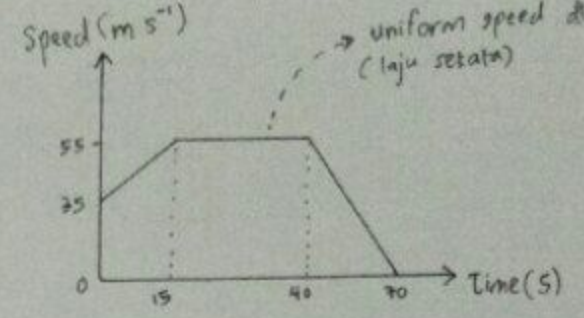
$$= 120\ km\,h^{-1}$$ ← tulis unit spt dlm soalan.

(ii) Average speed sepanjang pjalanan [$m\,s^{-1}$] → meter/saat

Formula Given in SPM :) | Average Speed = $\frac{\text{Jmlh Jarak ditalui / Total distance}}{\text{Jmlh masa / Total time}}$

Formula Diberi dlm SPM

$$= \frac{(40+40)\ km \times 1000}{60\ min \times 60} = 22.22\ ms^{-1}$$




first 15sec: Acceleration = $\frac{55-35}{15}$ = 1.33 ms⁻²

last 30sec: Acc = $\frac{50-0}{90-40}$ = 1.67 ms⁻²

[1] Gradient at any interval ⇒ Acceleration = $\frac{\text{change of speed}}{\text{duration time}}$

[2] Area under curve [Bahagi kpd subbahagian]

(paksi speed × paksi time)

$\frac{m}{s} \times s = m$.

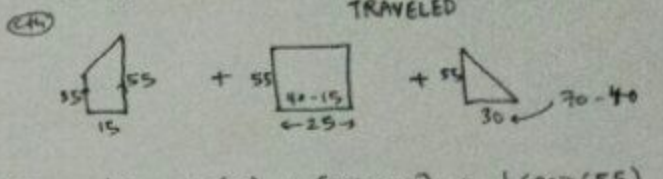
Formula Area Trapezium diberikan dlm spm.

$\frac{1}{2}$(sum of parallel) × height

$\frac{1}{2}(a+b) \times c$

AREA UNDER CURVE IS DISTANCE TRAVELED

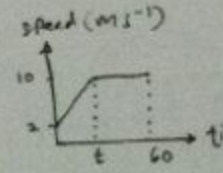
(CM)




Distance Travelled (Jarak ditalui) = $\frac{1}{2}(35+55)(15) + (55 \times 25) + \frac{1}{2}(30)(55)$

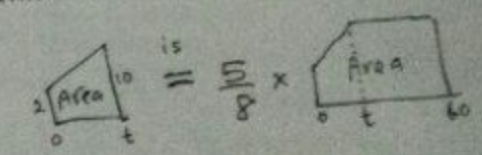
= 2875 meter. ← AWAS Jawapan kdgn² mst dlm kilometer, Jadi tukar kmlah.

TIP SPM




Given that the distance travelled by the particle in t seconds is $\frac{5}{8}$ of the distance travelled in 60 sec. Find t.

⇒ mathematical conversion




$\frac{1}{2}(2+10)(t) = \frac{5}{8} \times \left[\frac{1}{2}(2+10)(t) + (60-t)(10)\right]$

$6t = \frac{5}{8}(6t + 600 - 10t)$

$48t = 3000 - 20t$

$68t = 3000$

$t = 44.1$ second.

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# FORM 5 Bab 7 Probability

~ melibatkan perwakilan pecahan.

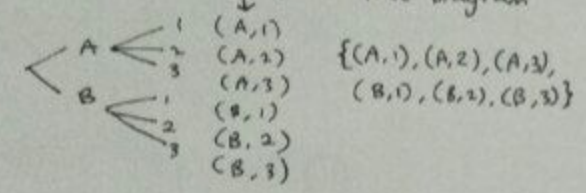
Probabiliti A ⇒ Pecahan A ⇒ P(A)

$$P(A) = \frac{\text{bil A}}{\text{bil Total.}}$$

| SPM Analisa | P1 | P2 |
|---|---|---|
| 2003 | – | 9 |
| 2006 | 35 | 7 |
| 2007 | – | 8 |
| 2008 | 24,35 | 10 |
| 2009 | 36 | 9 |
| 2010 | 35,36 | 8 |

Sample Space (rujuk Form 4)

Cth 1 Soalan: List down the outcome from Tree Diagram




Cth 4 dan atau

Abu ambil 2 bola.

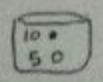
(i) Apakah kebarangkalian dapat 2 warna Hitam

P( Hitam & Hitam)

$= \frac{3}{8} \times \frac{2}{7}$ ← bil Hitam kurang 1 pd ambilan kedua. ← bilangan total kurang 1.

$= \frac{3}{28}$ ← & ganti Darab

Cth 2




Prob dpt Hitam

$P(\text{Hitam}) \Rightarrow \frac{10}{10+5} = \frac{10}{15}$

Cth 3 "seperti"

Given prob dpt hitam is $\frac{2}{3}$

$P(\text{Hitam}) \Rightarrow \frac{12}{12+x} = \frac{2}{3}$

$36 = 24 + 2x$

$36 - 24 = 2x$

$6 \frac{12}{25} = x$

(ii) Apakah Probability dapat 2 warna sama.

P(Hitam & Hitam) atau P(Putih & Putih)

$= \frac{3}{8} \times \frac{2}{7} + \frac{5}{8} \times \frac{4}{7}$ ← pecahan putih 5 dpd 8. ← atau ganti tambah

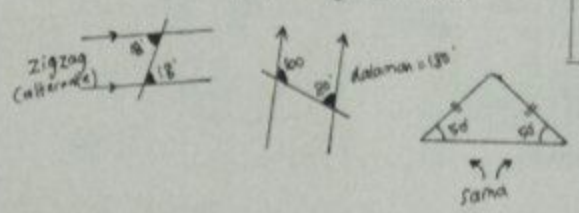
$= \frac{13}{28}$



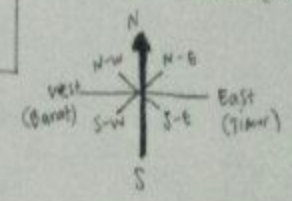
# FORM 5 Bab 8 Bearing

| SPM analisa | P1 |
|---|---|
| 2009 | 16 |
| 2008 | 17 |
| 2007 | 16 |
| 2006 | 17 |
| 2005 | 17 |
| 2010 | 17 |

Basic PMP → 2 garisan selari




Basic Arah (Geografi)

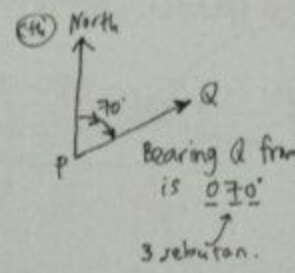



Bearing ⇒ Ertinya kedudukan (dlm sudut), merujuk titik Acas.

P pandang Q

Bearing of Q from P } Bermula dari titik P, &
Bearing titik Q dari P } Bermula dari utara titik P, Ikot arah jam sampai nampak titik Q.

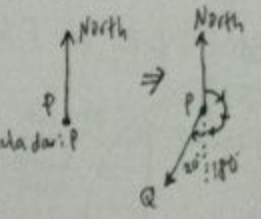
Cth North




Bearing Q from P is 070°

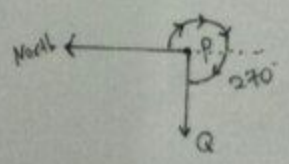
3 sebutan.

Cth Bearing Q from P is 200°



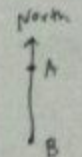

Cth UTARA dicondongkan (Sengaja)

Bearing Q from P = 270°

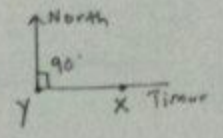



Kes Tertentu

① Diberi A is due North of B
erti: A di utara B

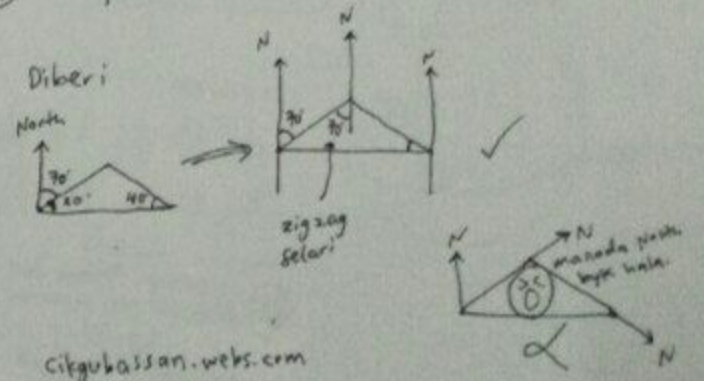



② Diberi X is due east of Y.
erti X di timur Y




③ walaupun byk titik, utara tetaplah sama

Diberi

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3 ⇒ 14.8

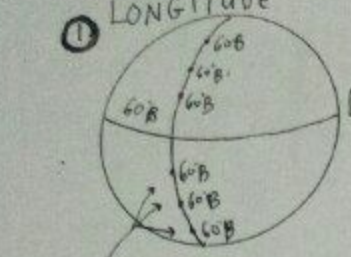
(v) 0.012307 ⇒ 0.0123

(v) 0.0010081

FORM 5 Bab 9 Earth Sphere

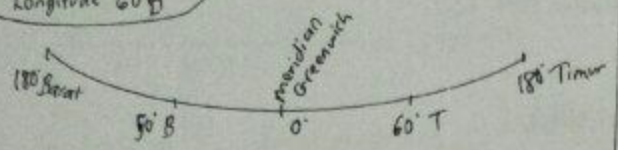
| SPM analysis | P1 | P2 |
|---|---|---|
| 2005 | 17,18 | 16 |
| 2006 | 18 | 16 |
| 2007 | 17,18 | 14 |
| 2008 | 18 | 16 |
| 2009 | 18 | 16 |
| 2010 | 18 | 16 |

## ① LONGITUDE

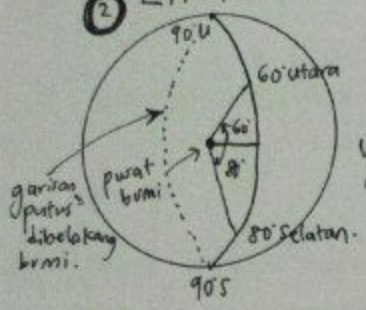



LONGITUDE : ukuran Timur/Barat dpt 0° ditentukan shg meridian greenwich.

Sepanjang titik ini Longitude 60°B



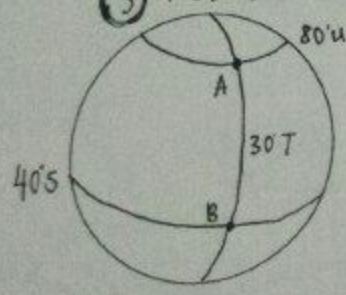

## ② LATITUDE




Nama Long-itude derive dpd sifat Khatulistiwa yg lebih panjang dpd jarak utara & selatan.

ukuran UTARA/selatan daripada Tengah bumi.

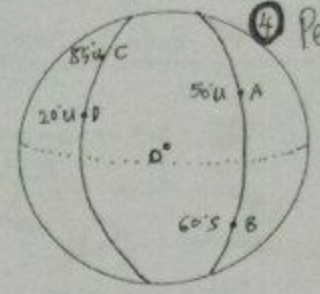
## ③ KEDUDUKAN (Latitude U/S, Longitude T/B)




kedudukan
A (80°U, 30°T)
B (40°S, 30°T)

Susunan terbalik dgn coordinate cartesan (x, y)
kiri/kanan, atas bawah

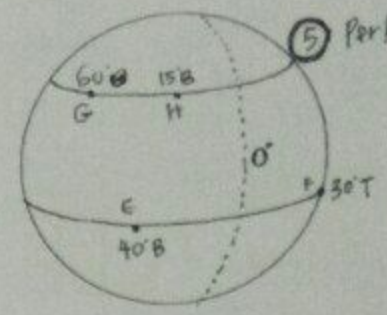
## ④ Perbezaan Sudut latitude




AB = 50 + 60° = 110° } Berbeza utara & selatan (tambah)

CD = 85 - 20 = 65° } sama utara selatan (tolak)

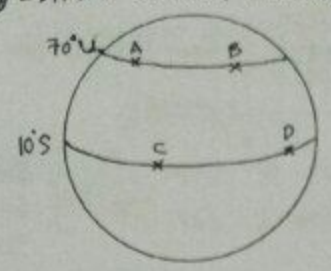
## ⑤ Perbezaan Sudut Longitude




GH = 60 - 15 = 45° } Sama Barat Barat (TOLAK)

EF = 40 + 30 = 70° } Berbeza Barat Timur (tambah)

## ⑥ Istilah: Common Parallel of Latitude:




longitude tak sama jarak

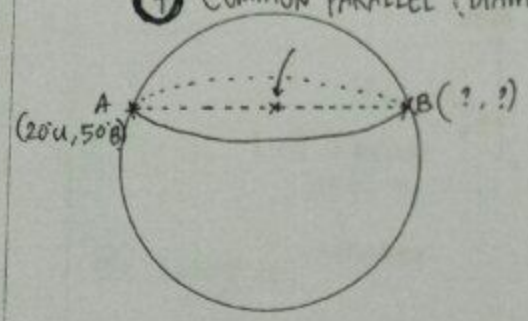


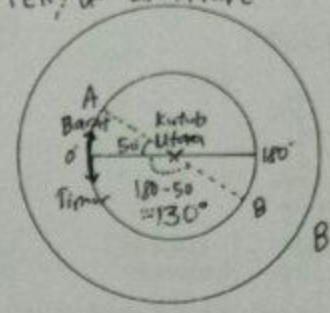
* only latitude shj boleh parallel. bukan longitude

A & B both latitude 70°U } Beza latitude = 70 + 10 = 80°

C & D both 10°S

## ⑦ COMMON PARALLEL (DIAMETER) of LATITUDE

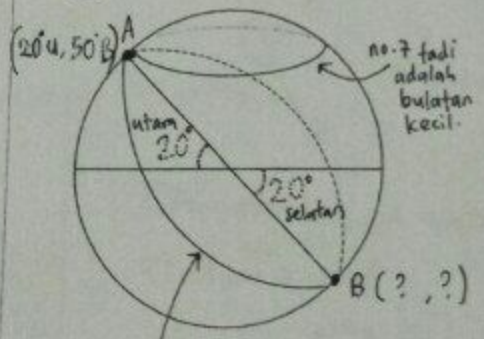


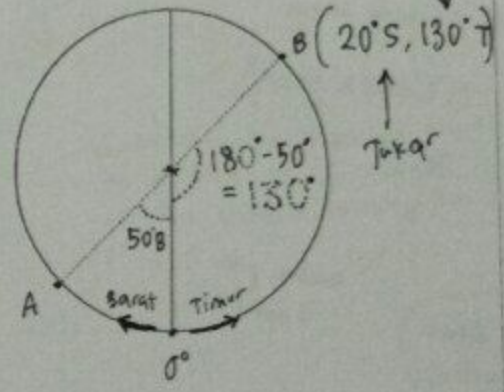

Sama ↓ B (20°U, 130°T)

(180-50) B≠T

## ⑧ DIAMETER of EARTH/GREAT CIRCLE.

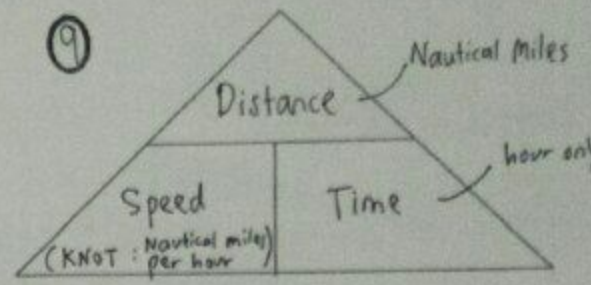



Bulatan besar bagai piring yg belah pusat bumi.

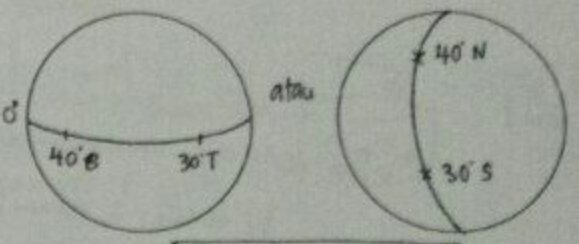



Tukar

## ⑨



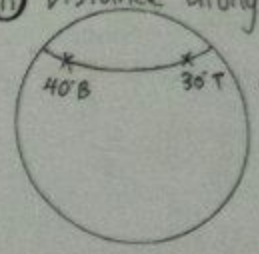

## ⑩ SHORTEST DISTANCE (mesti lalui Great Circle)




Formula: Distance = 60 × θ = 60 × 70 = 4200 nautical miles.

θ, beza sudut 40 + 30 = 70°

## ⑪ Distance along latitude (on 50° utara)




Distance = 60 × θ (beza sudut) × cos 50 (latitude)

= 60 × 70 × cos 50

= 2699.71 nautical miles.

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# Bab 10 Plan & Elevation

| SPM analisa | Paper 2 |
|---|---|
| 2005 | ✱ 15 |
| 2006 | ✱ 15 |
| 2007 | ✱ 13 |
| 2008 | ✱ 15 |
| 2009 | ✱ 15 |
| 2010 | ✱ 15 |

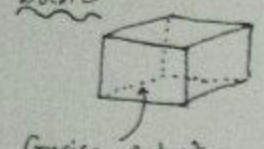
Istilah penting :

PLAN ⇒ Pandangan dari Atas object.

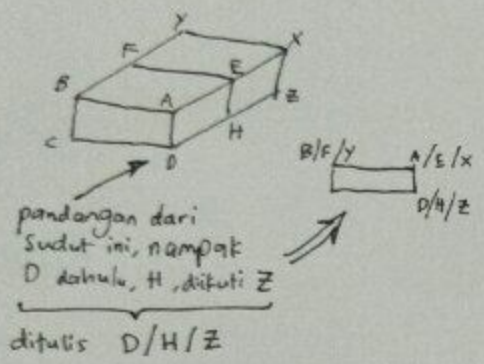
Elevation x ⇒ Pandangan dari sisi-x

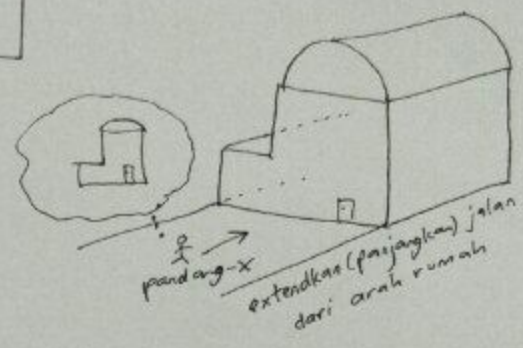
Full Scale ⇒ Ukuran sebenar (Guna Ruler)

Basic

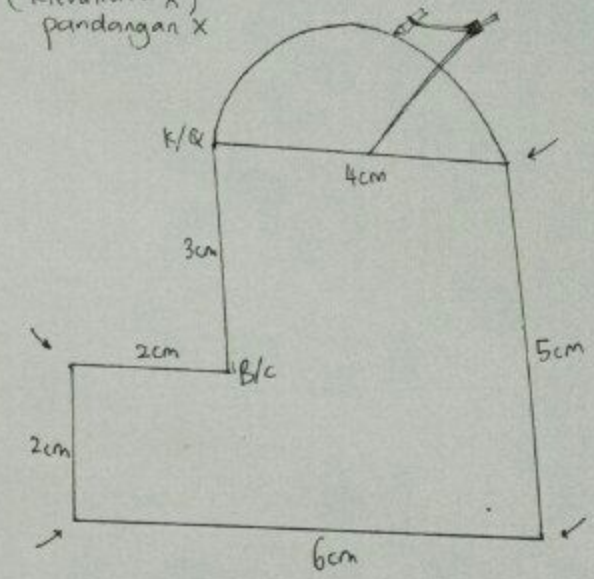


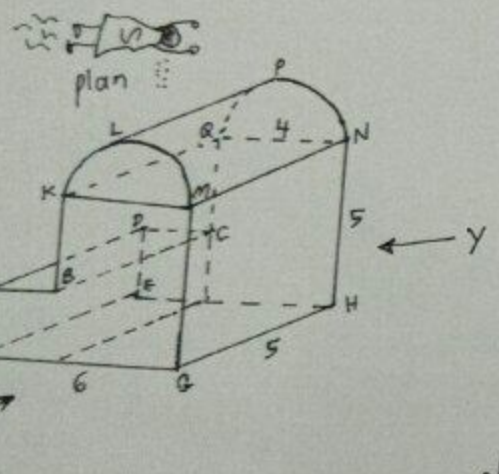
Garisan putus² sebab ia terlindung (dibelakang objek) lukisan.

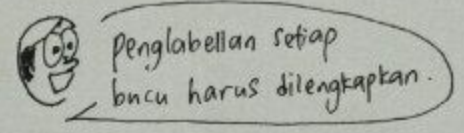


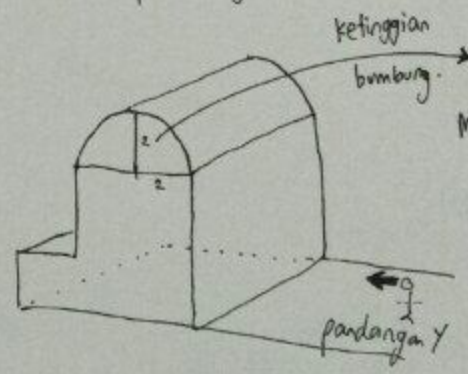

(Elevation - X)
pandangan X

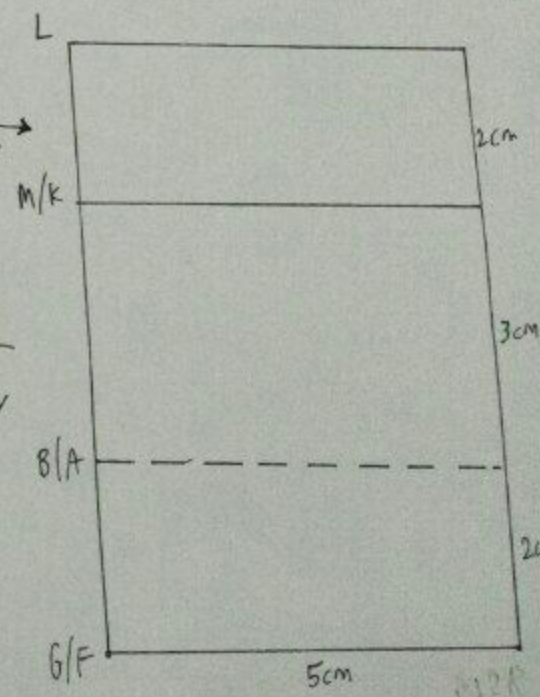


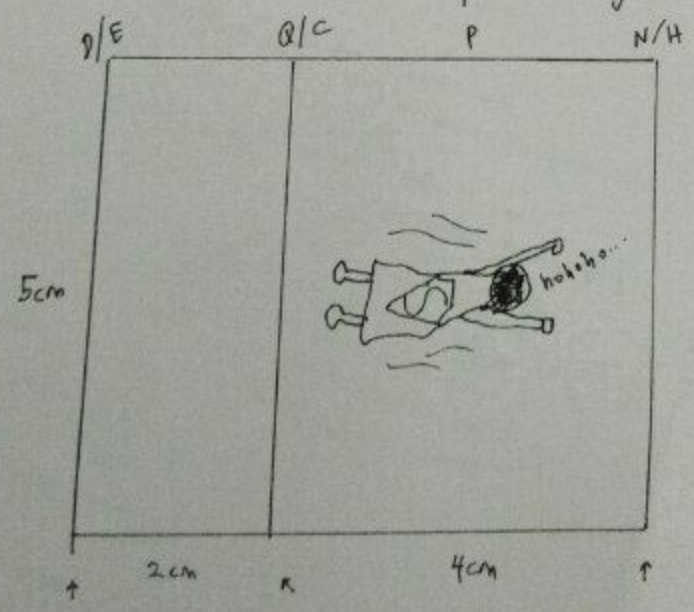



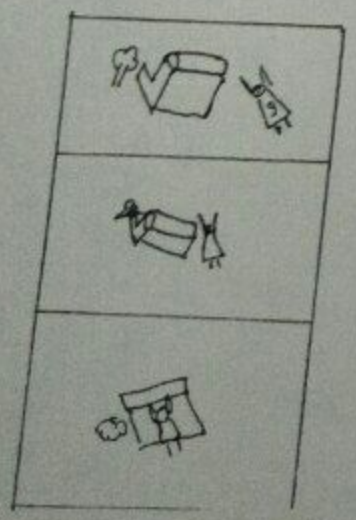

(elevation - Y)
pandangan Y




Plan ~ Nampak bumbung



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